

IMPROVING RURAL LIVELIHOODS IN SUB-SAHARAN AFRICA THROUGH SUSTAINABLE INTEGRATED MANAGEMENT OF SOIL FERTILITY

A STRATEGIC ALLIANCE FOR SOILS RESEARCH IN AFRICA

Soil fertility degradation has been described as the single most important constraint to food security in sub-Saharan Africa (SSA). Despite proposals for a diversity of solutions and the investment of time and resources by a wide range of institutions it continues to prove a substantially intransigent problem. Three international agricultural research centres (IARCs), CIAT, TSBF and ICRAF, have recently joined forces in an alliance targeted at tackling this challenge.

The rural population of SSA is trapped in a vicious cycle between poverty, land degradation and the lack of resources, knowledge or opportunity to generate adequate income to break out. A large proportion of the soils in SSA exhibit a variety of constraints to agricultural production, among them, nutrient deficiency, low organic matter, moisture stress, and high erodibility. In agricultural systems nutrient balances are commonly negative due to failure to replace those removed in crop harvest and other losses. A range of economic and institutional failures has resulted in fertiliser use in SSA being by far the lowest in the world.

Soil fertility decline is not just a problem of nutrient deficiency but also of inappropriate germplasm and cropping system design, of interactions with pests and diseases, of the linkage between poverty and land degradation, of often perverse national and global policies with respect to incentives, and of institutional failures. Tackling soil fertility issues thus requires a long-term perspective and an holistic approach

PROGRESS AND ACHIEVEMENT

The good news is that progress is being made. Farmers in SSA are attempting to improve soils, but their efforts are constrained by limited access to knowledge, low resource endowments, and lack of incentives. Soil fertility degradation takes place over a long time and recuperation of soil quality can be equally slow so that lasting impacts of improved management require long-term investment of time and resources. But the impacts of improved management on crop yields are often dramatic even in the short term. Such effects can be seen from a range of technologies and practices that have been implemented and adopted in many parts of the continent including: integrated nutrient management (ie. combinations of fertilisers with organic inputs of various kinds), high-efficiency micro-dose use of fertilisers, improved manure management practices, inter-cropping systems, integration of multipurpose legumes, improved fallows, biomass transfer of high quality organic inputs. The increasing success with these practices is derived from the emergence of a consensus on guiding principles for Integrated Soil Fertility Management (ISFM). In essence, ISFM is the adoption of an holistic approach to soil fertility that embraces the full range of driving factors and consequences – biological, physical, chemical, social, economic and political – of soil degradation. There is a strong emphasis in ISFM research on understanding and seeking to manage the processes that contribute to change. The emergence of this paradigm, very closely related to the wider concepts of Integrated Natural Resource Management (INRM), represents a very significant step beyond the earlier, narrower, nutrient replenishment approach to soil fertility enhancement.

THE WAY FORWARD

This progress has demonstrated that investing in farmer-centred soil fertility research is integral to successful rural development. Despite these successes however the impact is still small in scale and often disappointingly short-term. The major target for

future research is to empower farmers to sustainably manage their soils. Moving from a nutrient replenishment to a pro-poor approach to soil fertility management allows local approaches to generate global benefits.

By taking a pro-poor approach, international agricultural research has developed the means to achieve large-scale impacts, responding to the demands of small-scale farmers for improved agricultural production and ecosystem services. Many ISFM options are locally profitable, even under intensely cultivated, land-scarce conditions. The knowledge-intensity and complexity of the ISFM approach, however, makes it difficult to translate local successes from one area to another, unless the factors favouring and constraining adoption are better understood. Increasing our understanding of where ISFM options are working, why, and for whom, will address the constraints limiting their wider use. The cost of not engaging in this research is likely to be enormous, in terms of greater poverty, stagnant and declining production, degraded ecosystem services, and the loss of intellectual property rights related to the local genetic resources of the soil. Stable funding is critically needed to improve this position and to provide for the laboratory facilities that are essential for ISFM research.

Three international institutions have joined together to form a strategic alliance, the goal of which is “to improve rural livelihoods in SSA through sustainable integrated management of soil fertility”. The three partners have made significant contributions to combating soil fertility degradation over the past decade and also have a long record of collaboration through joint research projects.

The former Tropical Soil Biology and Fertility Programme (TSBF), an international institution solely devoted to ISFM research, has joined with the International Centre for Tropical Agriculture to form the TSBF Institute of CIAT. This merger builds on the strong collaboration between CIAT and TSBF in soil fertility research in East Africa that has developed within the CGIAR Systemwide Programme on Soil Water and Nutrient Management (SWNM) for which CIAT is the convening centre. The third partner in the alliance is the International Centre for Agroforestry Research (ICRAF) has played a leading role in ISFM research in SSA over the last decade, including representation of the CGIAR in the World Bank Soil Fertility Initiative for Africa (SFI). TSBF and ICRAF have also collaborated closely in soils research for many years.

The alliance is committed to a fully integrated research programme built round five major themes: (i) Empowering farmers to scale up research and results; (ii) Managing carbon and nutrient cycles for enhanced agricultural productivity; (iii) Managing soils for enhanced ecosystem services; (iv) Managing soil genetic resources for enhanced biodiversity and pest management; and (v) Capacity building for ISFM research and development.

The alliance is itself the beginning of a process of greater institutional collaboration, effectively presenting a nucleus around which greater future collaboration can take place when addressing ISFM. By building on the existing networks, systemwide and regional programmes of both NARs and IARCs, sufficient capacity may be achieved in all phases along the research – development continuum. As described above soil fertility degradation is a long-term problem. Funding support for ISFM research is needed that recognises both the urgency for immediate actions and for longer-term investment in lasting solutions. At the heart of that support is the vital need to maintain a critical mass and diversity of soil scientists in SSA. This requires a targeted and committed investment in ISFM to enable and enhance the momentum that has already been achieved by the alliance and its partners.